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(54) Title: LIPID COMPOSITIONS AND USE THEREOF

(57) Abstract: The invention provides a composition suitable for use as a transfection agent, comprising a cationic cardiolipin analogue and, another lipid species. The composition of the present invention can facilitate transfection of a wide variety of polynucleotide species (e.g., oligodeoxyribonucleotides, plasmids, RNAi species, etc.). Moreover, the transfection agent of the present invention is effective in promoting transfection of primary cell cultures as well as transformed cells. Also, the inventive transfection agent is suitable for use both *in vitro* and *in vivo*. The inventive composition has additional uses as well, such as delivery of a variety of active agents, dermatological and cosmetic uses, and uses in agriculture. The invention further provides a method of introducing an active agent into a cell by contacting the cell with the inventive composition. The invention further provides a method of inhibiting the growth of neoplastic cells and a method of treating a patient suffering from a neoplastic disease by employing the inventive composition, wherein an active agent is an antineoplastic agent. The invention further provides a method for validating a genetic target, comprising (a) administering to a cell a composition comprising a cationic liposome and a siRNA, whereby the siRNA enters the cell inhibits the expression of a gene within the cell and (b) assaying for the inhibition of the gene. The method also provides a fluorescent/ luminescent cationic cardiolipin analogue and compositions including such analogues. Using a cationic cardiolipin analogue, the invention provides a method of tracking the migration of a lipid substance within an animal.

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